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**REGIONAL DISPARITIES IN AGRICULTURAL DEVELOPMENT IN HARYANA**

**Anju Rani**

Research Scholar, Dept. of Economics  
Central University of Haryana

**ABSTRACT**

Agriculture is a mainstay of Indian economy. GDP during the period 1980 growth rate of more than 3 % per annum which has gain on population growth and enable the country to substitute import of food grain and attain food security at national level. At that time of independence, India's agriculture was backward and qualitatively traditional in the nature. In India, production and productivity has been increasing since green revolution with increasing use of high yielding seeds, synthetic fertilizers, and extent of irrigation, mechanical power and electricity in farm operations. The period after 1966 saw substantial increase in food grains production especially wheat production. Main objectives of this paper is to estimate Production and productivity of selected major agriculture crops in Haryana during the period 2011-12. Data will be collected from different published issues of 'Statistical Abstract of Haryana'. For analyzed the objectives, Compound Growth rates (CGR) and coefficient of variation will be used by fitting exponential function.

**KEY WORD: Production, Productivity and Growth**

**INTRODUCTION**

At that time of independence, India's agriculture was backward and qualitatively traditional in the nature. In India, production and productivity has been increasing since green revolution with increasing use of high yielding seeds, synthetic fertilizers, and extent of irrigation, mechanical power and electricity in farm operations. The period after 1966 saw substantial increase in food grains production especially wheat production. HYV depended for its success especially on the availability of proper irrigation facilities and various others in new strategy. The production of rice increased slowly in the early period of the Green Revolution. After the use of modern inputs at a proper quantity, the production of rice increased at a significant level. With modernization of agriculture production systems and use of mechanical power sources, animal use has drastically reduced. To increase cropping intensity and to reduce "turn-around time", higher energy inputs for field operation are required. The agriculture productivity is directly related with the technology adoption (Misra and Puri, 2008).

**OBJECTIVES OF THE STUDY**

- To estimate regional disparities in production of selected major agricultural crops in Haryana
- To estimate regional disparities in productivity of selected major agriculture crops in Haryana

**REVIEW OF LITERATURE**

**Kuchhadiya et al. (1992)** examined that the growth rates of production and productivity of oilseeds under study were computed by fitting exponential function. They found that the growth rates of productivity of castor, rapeseed and mustard had increased. But the sesame growth rate of production and productivity

were found to be negative during the post green revolution period, indicating the decreasing trend in yield in per hectare of sesame.

**Bhowmick and Ahamed (1993)** trend analyzed in area, production and productivity growth for pre and post-Green Revolution period along with the pooled data on major oilseed crops in Assam. They found that the technology generated in oilseed crops was not wholly adopted by farmers due to a number of factors. The increase in production of oilseed crops in the State was due to increase in acreage only. Productivity growth was noted to be more or less stagnant which could be attributed to poor adoption of improved technology.

**Maity and Chatterjee (2010)** to estimate the food grain production growth in West Bengal over the period 1969-2003. They concluded that the food grain production growth was decreasing returns to scale to modern inputs. The per cent change in all the inputs could not lead to change food grain production by equal percentage.

#### SOURCES OF DATA

The present study is based on secondary data which were collected from Ministry of Agriculture Government of India and 'Statistical Abstract of Haryana' for the period 1992-93 to 2011-12.

#### SELECTED CROPS

In the present study 12 major crops (Wheat, Rice, Bajra, Gram, Moong, Massar, Groundnut, Rapeseed & Mustard, Sugarcane, Cotton American, Cotton Desi and Maize) were selected.

#### METHODOLOGY

For fulfil the objectives, Compound Growth rates (CGR) and coefficient of variation were used by fitting exponential function. Using the least square method, the following form of exponential function was used to calculate compound growth rates.

$$Y = A (1 + r)^t \text{ ----- (i)}$$

Where, Y = Production and Productivity of the crops

A = Constants

r = Compound growth rate

t = time variable in years (1, 2 ----- 20)

In semi logarithm form, equation (i) takes the forms

$$\log Y = \log A + t \log (1 + r)$$

$$Y^* = a + bt$$

Where  $Y^* = \log Y$

$$B = \log (1 + r)$$

$$r = \text{Antilog } b - 1$$

In percentage term  $r = (\text{Antilog } b - 1) \times 100$

**COEFFICIENT OF VARIATION**

The coefficient of variation (C.V) is used to measure the extent of interstate disparities in respect of food grain cultivation cost. The coefficient of variation is computed as a ratio of standard deviation to mean of the observations i.e.

$$C.V. = (\text{Standard Deviation})/\text{Mean}$$

**RESULT AND DISCUSSION**

Major Crops	Period-1		Period-2		Period-3	
	1992-93 to 2000-01		2002-03 to 2011-12		1992-93 to 2011-12	
	C.G.R	C.V	C.G.R	C.V	C.G.R	C.V
Cotton American	-2.12	16.11	10.45	36.25	1.42	28.13
Bajra	0.02	36.11	6.50	28.55	3.28	34.53
Cotton Desi	14.67	52.27	-1.21	29.24	5.30	42.96
Gram	-3.74	31.57	-7.41	72.00	-11.39	71.36
Ground nut	-1.90	13.57	15.41	69.00	-3.56	44.96
Maize	-0.80	13.40	-2.21	16.59	-2.05	71.36
Massar	-4.83	14.18	-9.13	29.95	-4.97	44.76
Moong	2.69	19.96	18.71	59.04	2.71	18.72
Rice	5.16	39.33	4.13	13.71	4.01	31.24
Rapeseed Mustard	2.71	17.23	2.44	18.23	1.86	51.02
Sugarcane	1.19	28.00	2.03	12.12	1.47	24.04
Wheat	2.86	9.01	0.79	5.62	2.77	16.87

**Source: Department of Economic and Statistical Analysis, Haryana**

Table 1 shows that the maximum C.G.R is recorded in the case of Cotton Desi (14.67per cent) due to the adoption of new technology and minimum growth rate in Massar (-4.83 per cent).The highest variability in case of cotton desi and lower variability is in case of wheat in first period in second period moong has shown maximum CGR with the value18.71% and minimum growth rate in case of Masser -9.13%. The highest variability has been noticed in case of gram 72% and crop like wheat has showed lower variability in overall period maximum positive growth rate is in case of cotton desi and minimum CGR has recorded in case of gram.

**Table 2: Compound Growth Rate and variability in Productivity of Major Agricultural Crops in Haryana**

Major crops	Period-1		Period-2		Period-3	
	1992-93 to 2000-01		2002-03 to 2011-12		1992-93 to 2011-12	
	C.G.R	C.V	C.G.R	C.V	C.G.R	C.V
Cotton America	0.54	14.39	8.61	31.80	1.40	25.95
Bajra	2.34	28.89	5.93	25.18	3.53	30.68
Cotton Desi	2.26	21.43	10.47	36.08	3.20	33.60
Gram	2.39	18.78	-1.45	19.02	-1.11	20.21
Ground nut	0.69	5.85	1.33	4.46	-0.04	5.48
Maize	5.24	19.65	1.47	11.92	4.03	25.13
Massar	2.02	7.92	-0.40	9.08	2.07	15.25
Moong	1.20	9.53	9.56	40.24	-3.00	33.84
Rice	0.53	8.16	4.33	12.89	0.83	10.74
Rapeseed & Mustard	-5.76	23.86	-0.77	10.78	1.18	18.39
Sugarcane	0.84	5.79	2.18	7.49	1.09	8.25
Wheat	1.46	5.28	0.08	3.28	1.11	7.46

**Source: Department of Economic and Statistical Analysis, Haryana**

**Table 2** shows CAGR and variability of productivity of agricultural crops. The maximum growth rate has been recorded in the case of maize in first period and over all study period is minimum in the case of rapeseed & mustered (-5.76%) in first period. Maize has maximum growth rate and moong has shown minimum, growth rate. Some crops have a decreasing growth rate because of low partial adoption of new input technology and without proper resource management. The highest variability has been recorded in case of bajra in first period and lowest in case of wheat during the first and second period. The highest variation has been recorded in case of moong and lowest variation in case of groundnut.

## CONCLUSION

The production and productivity of these crops like Cotton American, Cotton Desi, Bajra, Rice, Rape seed and Mustered, Sugarcane and Wheat have positive growth rates due to the adoption of new inputs technology. On the other side, the production and productivity of the crops like Gram and Groundnut have negative growth rates during adoption of new technology.

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